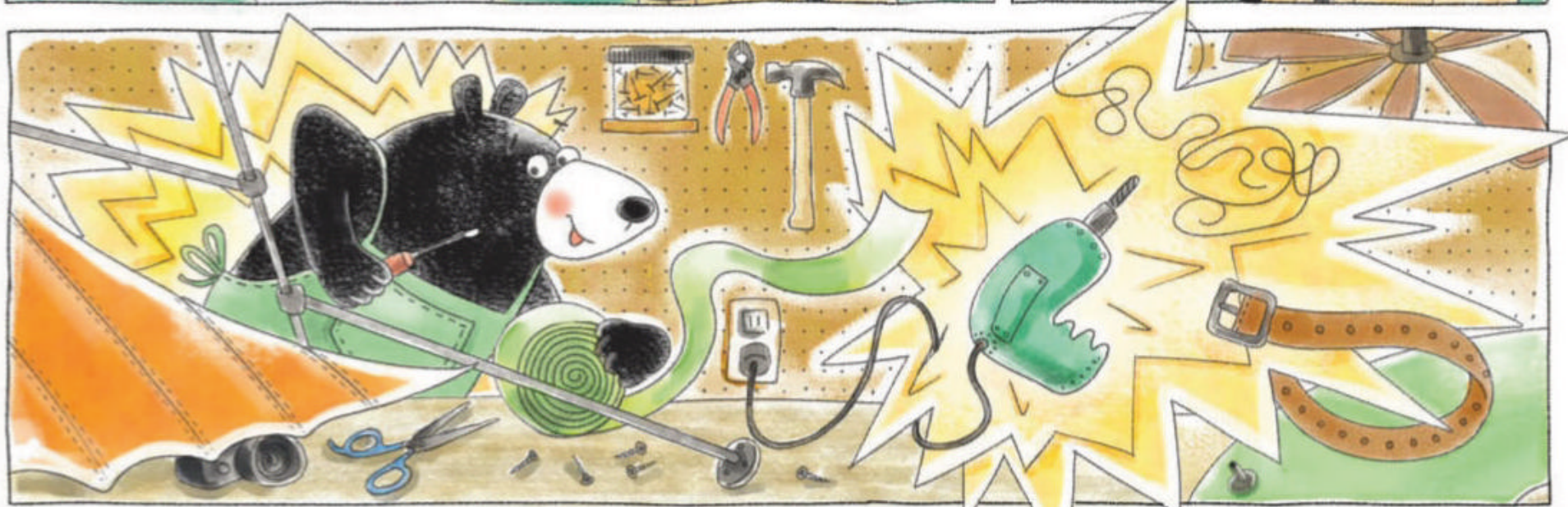


Beatrice Black Bear

The World's Most Inventive
Bear Photographer
By John Grandits
Illustrated by Paige Billin-Frye



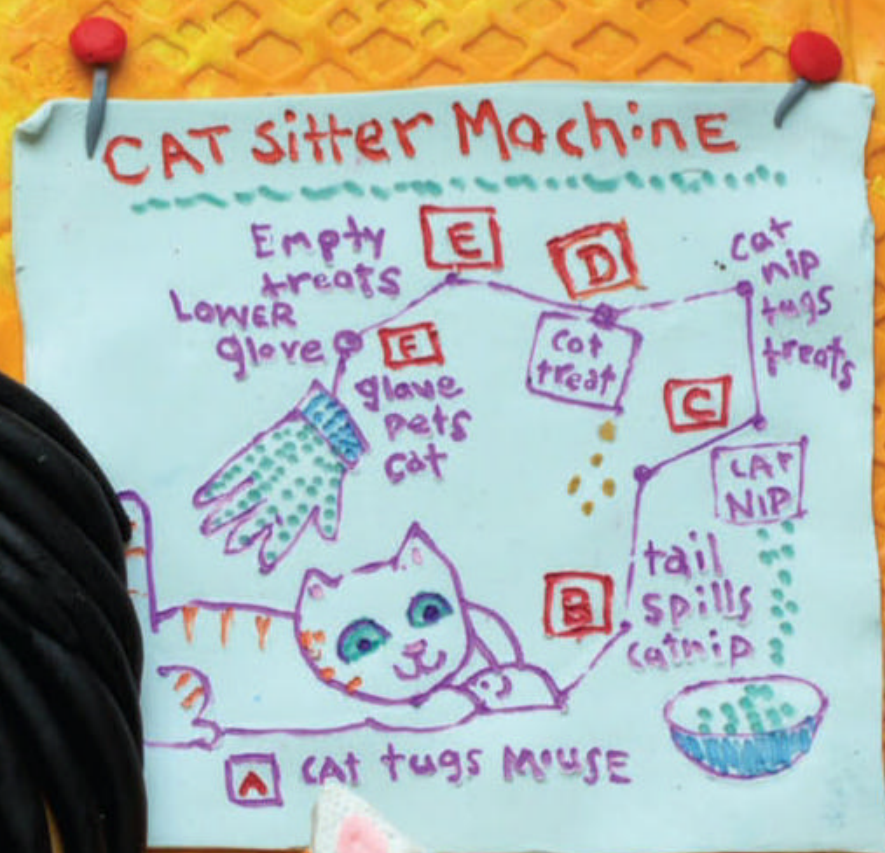
February 2019 Volume 22 Number 2 cricketmedia.com \$6.95



click

opening windows for young minds

Let's invent





Click Looks Closer

Inventing Never Stops

For thousands of years, people dreamed of inventing a flying machine. Finally, on December 17, 1903, Orville Wright flew the very first airplane. He and his brother Wilbur had spent years designing and building the plane. Did they stop working on their invention once it flew? No way!

This is not working.

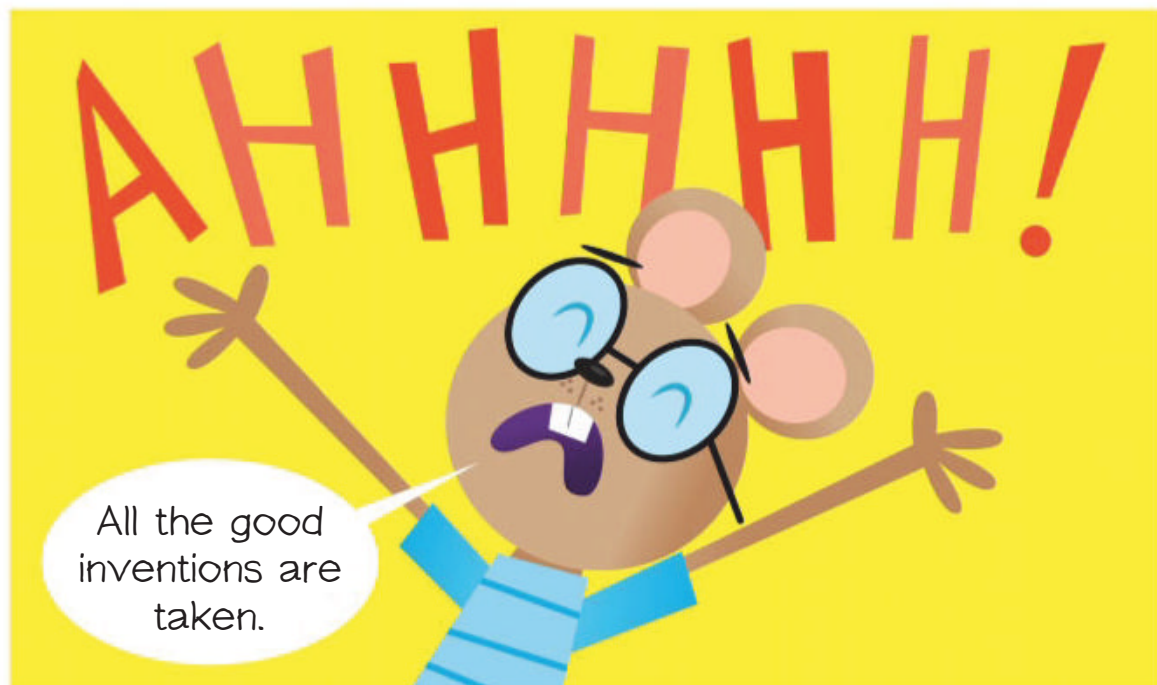
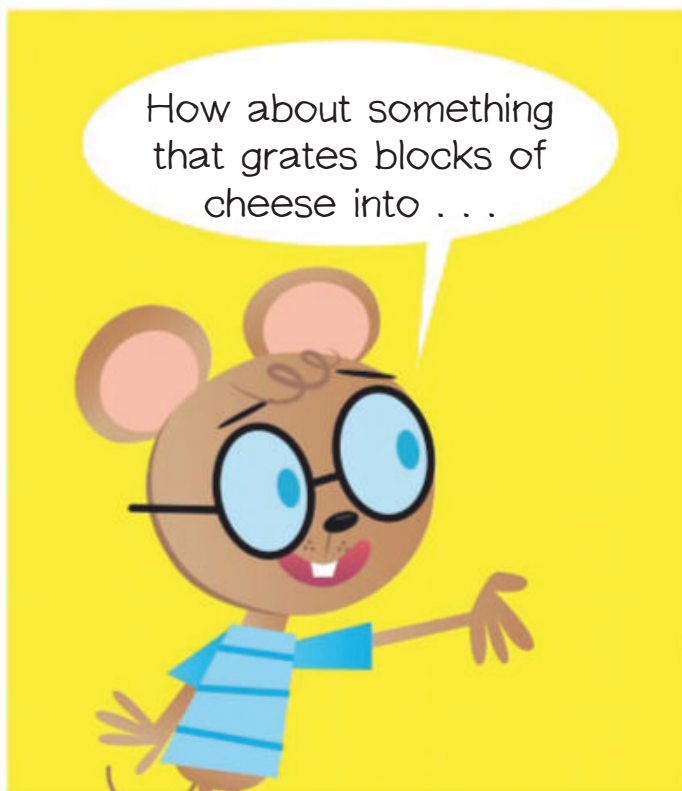


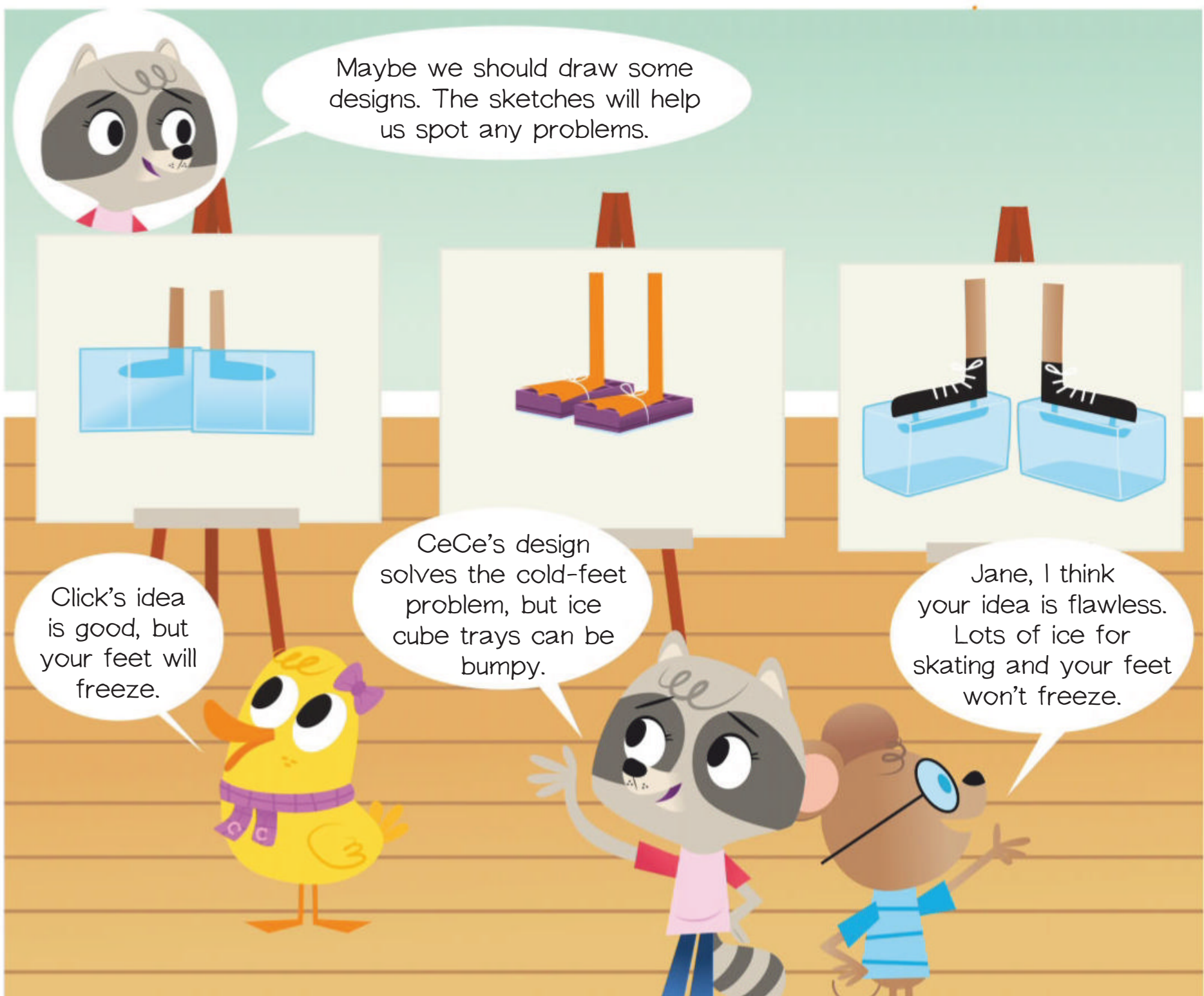
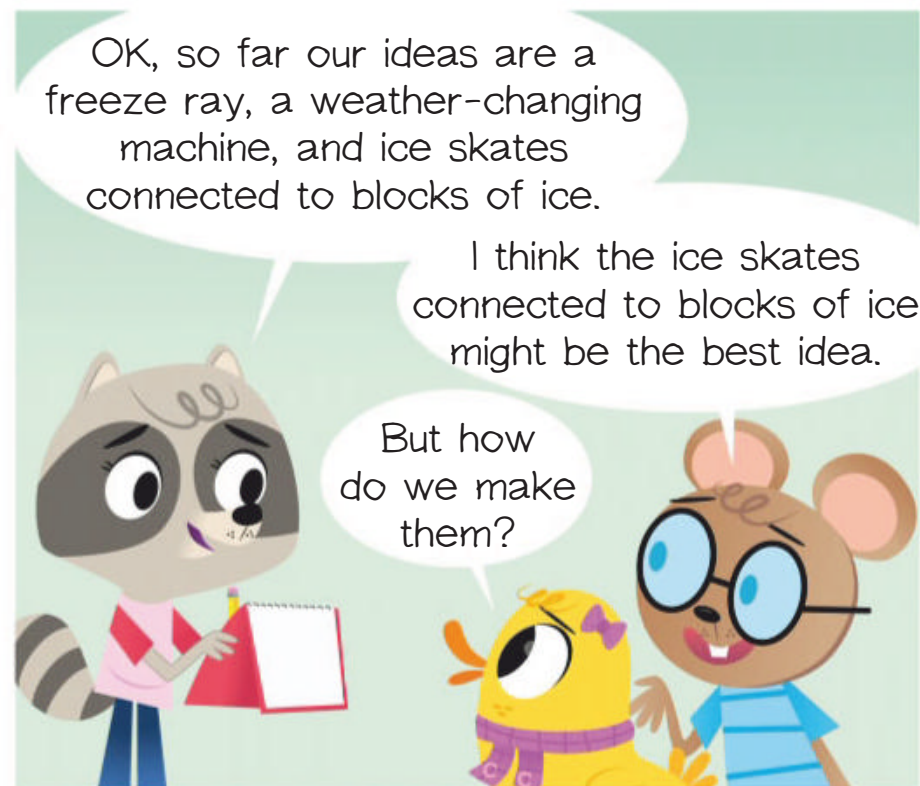
I have no problems!



Other inventors built on their ideas too. Turn to page 34 to see some inventions inspired by the Wright brothers' famous *Flyer*.

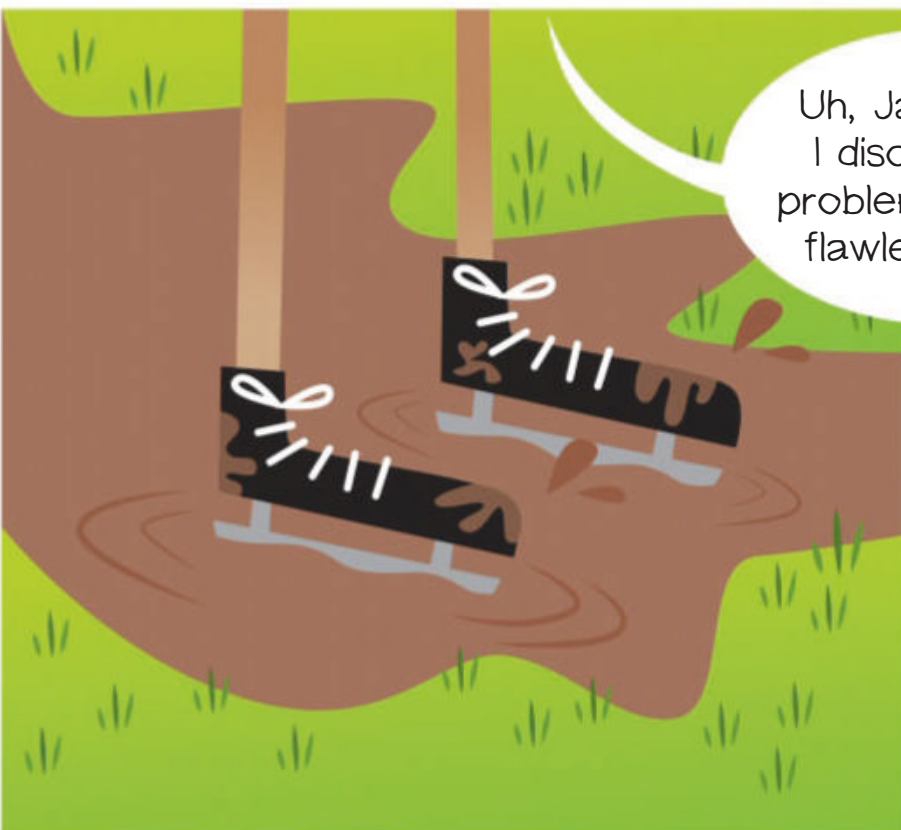






LATER







Meet Inventor **Nate Ball**

by Rachel Young

Today I'm visiting my friend Nate Ball. He's going to tell me all about inventing.



Click: Hi, Nate. It's so cool that you're an inventor. How long have you been one?

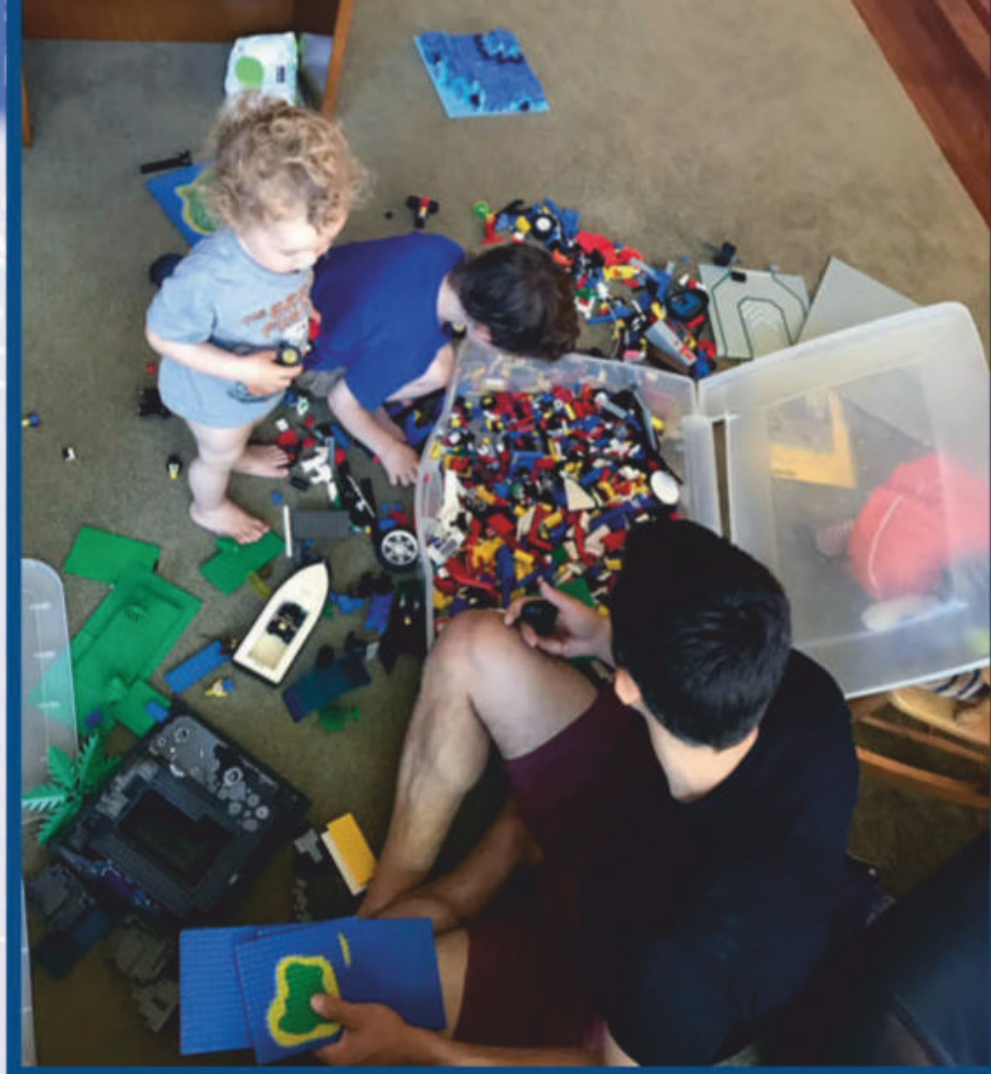
Nate: Always! When I was a kid, I built my own creations with Legos, blocks, wood scraps, old bike parts, whatever I could find. And my dad would give me old electronics equipment to play with. Taking stuff apart gave me ideas for how to make new things.

Nate had lots of ideas for stuff to build when he was a kid—a bottle rocket launcher, a land sailboat, and a pedal car with a seat for his little sister!



Click: I like blocks and Legos too, Nate! But sometimes the stuff I build doesn't work the way I thought it would.

Nate: That happens to me all the time, Click. Inventing is about problem solving. You have to try, fail, fix it, and try again—over and over again.



Click: What was one of your failures?

Nate: When I was a kid, I wanted to make a go-kart, but I didn't know how. I built one that steered like a Lego car. But what worked for a little Lego car didn't work for a big go-kart. When I drove down our steep driveway, I couldn't steer and I crashed!

Click: Yikes!

Nate: But I kept trying and eventually I figured out how to use ropes to pull the wheels left and right.

Grown-up Nate still likes to build with Legos. But now his sons Calvin and Leo help.

The first go-kart Nate built crashed when he tried driving it.



Nate built this kayak from someone else's plans. Building from plans helped him learn how to design things better.



Click: That's not at all like a Lego car.

Nate: Your first try at an invention almost never works the way

you thought it would. But it does help you know what *not* to do.

Click: Then what?

Nate: You have to look at the big problem—why isn't this working?—and break it up into smaller problems. You solve those small problems one by one until your invention works!

Click: So, inventing is solving problems?

Nate: It sure is. The best inventions solve problems, big or small.

And, look, it floated!



Click: What's a problem you solved?

Nate: My friends and I invented the Atlas Powered Ascender to help rescue workers lift people out of caves and other tight places. It used to take a whole team of people hours to do the job. Now one or two people can do it in a much shorter time.



Click: Your head must be full of ideas. How do you have so many?

Nate: It helps me to move my body before I sit down to create and invent. I started pole vaulting when I was a kid, and I discovered that my brain worked best after I practiced.

Click: I don't pole vault, but I do like to jump and play.

Nate: That'll work! Doing something creative can help too. I love to play the piano. It's a lot like inventing. You have to practice hard, combine old ideas with new ideas, and share your ideas with other people.

Nate's Atlas Powered Ascender lifts people up—fast. He and his friends invented it for search and rescue teams. But you never know how an invention will be used. Now people use it to fix power lines on high towers too.



Go, Nate!





Click: Jane and I make up silly songs to sing. Will that help with inventing?

Nate: Of course! You don't have to be a pole vaulter or a piano player like me. Anything active or creative will help you be a better inventor.

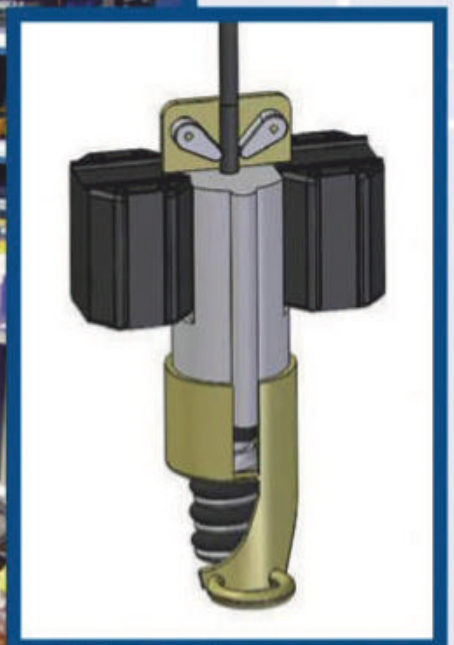
Click: What do you do when you get an idea?

Nate: First, I like to get the idea out of my head and on to paper. I make a sketch and label the parts and draw arrows to show how the parts are supposed to move.

Click: How does that help?

Nate: As soon as I start drawing, I'm problem solving. Putting an idea on paper helps me see how I might have to change something to make it work.

Nate uses a computer to draw some ideas. Here's one of the pictures he and his friends made of their powered ascender invention.



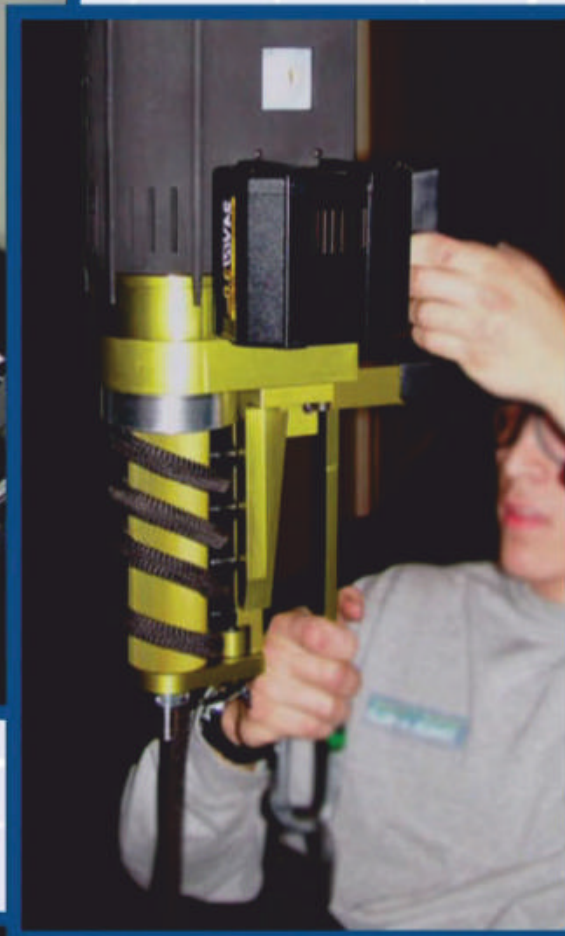


Click: But how does it get from paper to the real thing?

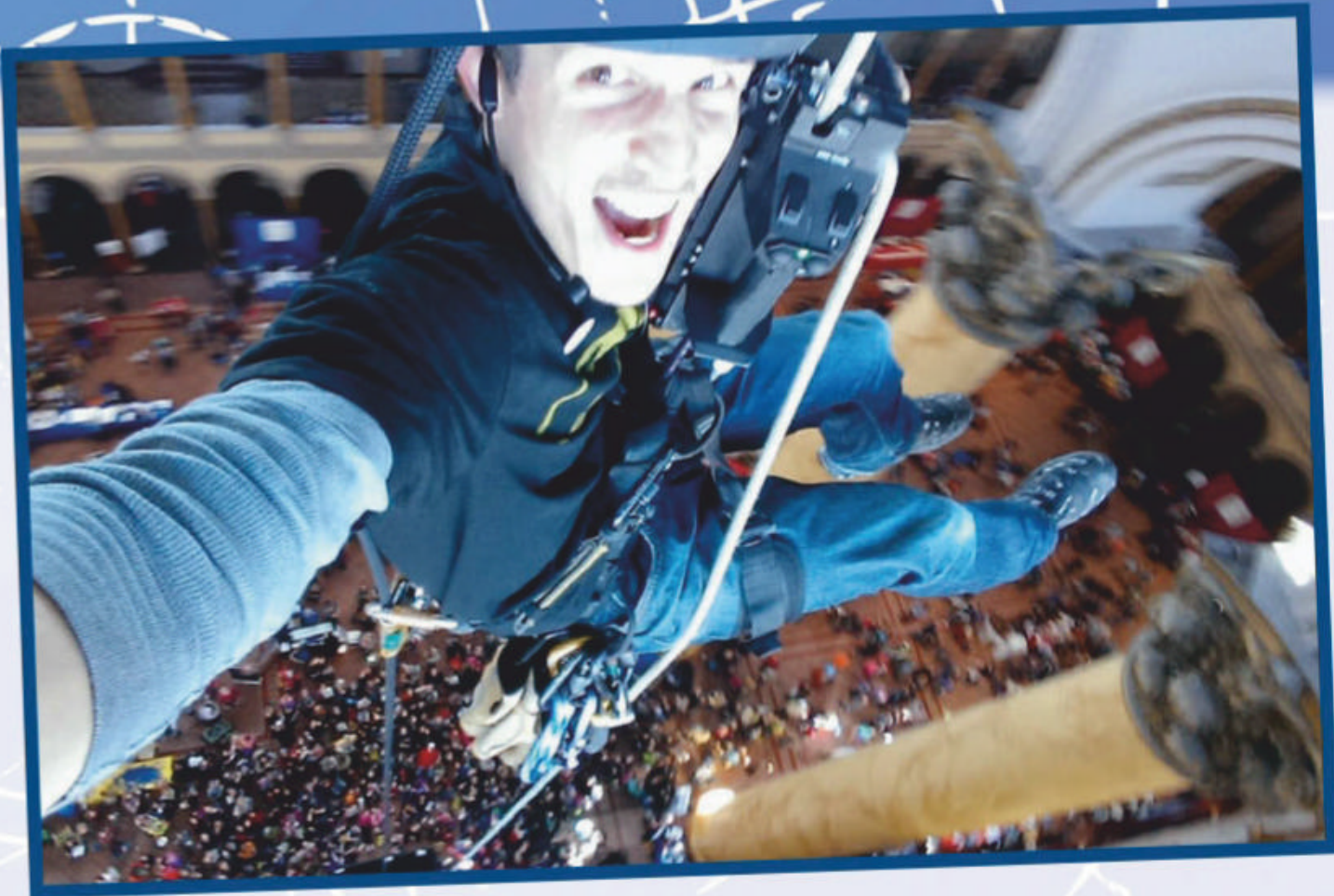
Nate: The first step is to build something called a prototype. It's a sample or model of your invention. For something big, like a rocket ship, you build a small prototype. Then you test the prototype to see if your idea works. Usually it doesn't. Sometimes I go through dozens of prototypes before I'm ready to build the real thing.

Click: Wow! Inventing is a lot of work.

Nate: It is, but it feels amazing to see your invention help people. And to see people invent new uses for your invention.



When Nate and his friends had a sketch they liked, they built a prototype of the powered ascender and tested it.



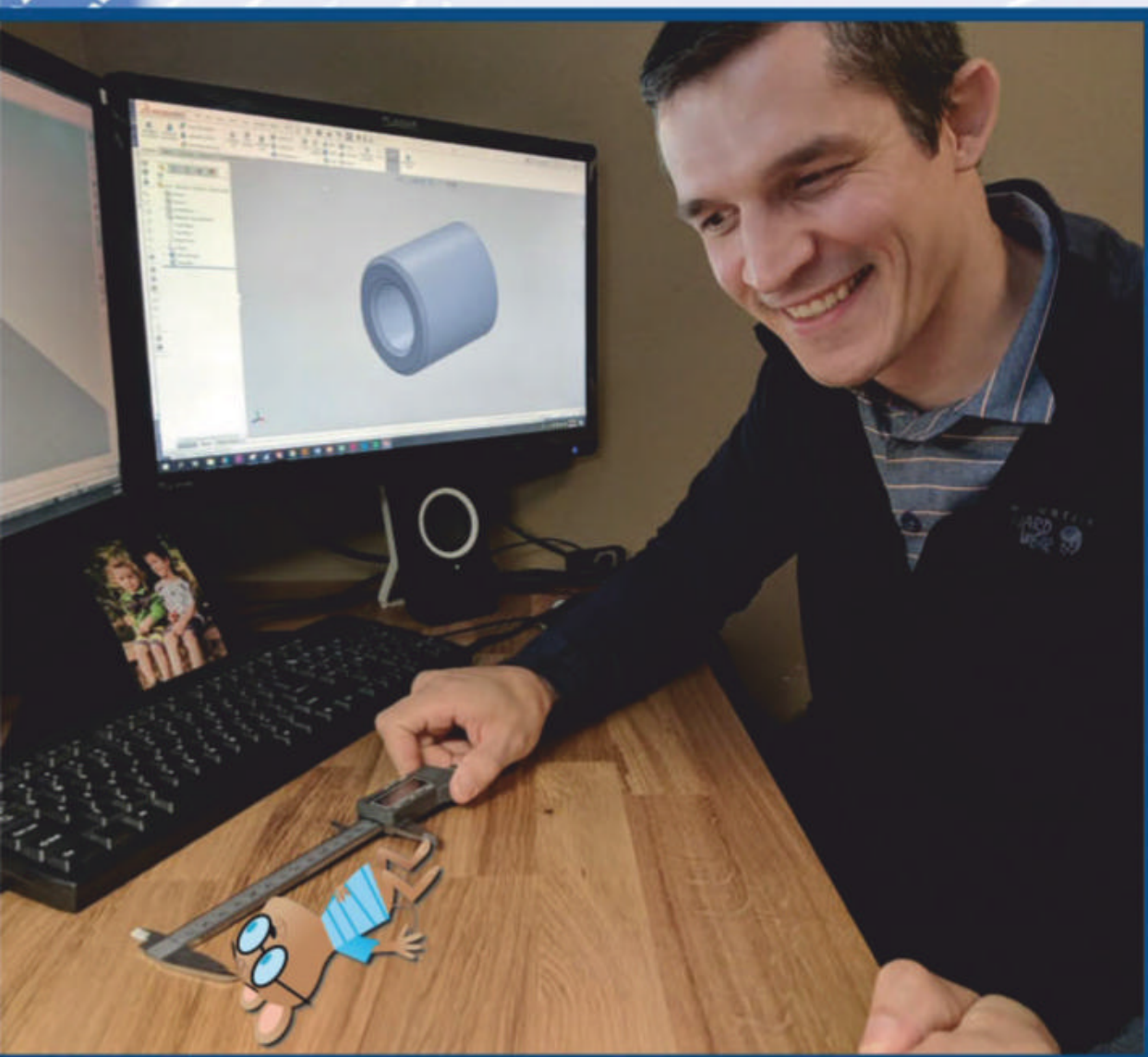
Nate keeps working to make his inventions better. Look how high he can go with the powered ascender now!

Click: I want to be an inventor too! Here's my sketch for a back scratcher that also holds a radio, a plate of cheese, and a *Click* magazine. I can have my favorite

magazine, snack, and song all at once. Plus get my back scratched! Can you help me make it, Nate?

Nate: I'd love to, Click. I have some Legos right here. How about if we start with a prototype? I'll just measure you first to see how big we should make it.

Click: Thanks, Nate!



Be an Inventor

art by Mark Hicks

Anyone can invent.
What do you do? Solve problems! How?

Find a
problem,
and think
about ways
to solve it.

Brrr! I need
mittens for my
nose.

Has anyone else
tried to solve a
similar problem?
What can you learn
from their ideas?
How will your idea
be different?

Hmm, maybe
if I had two
noses.

I can't
talk!

I can't keep
my hand up
all day.

How will your invention work? Draw a sketch to help you figure it out.



Make a model. If you need help, ask!



Try your invention. What works and what doesn't?



Make improvements, and test again. And again. Keep fixing until you're happy. You might even get a brand-new idea.

Nope.

Ooh, it keeps my ears warm too!

And I can push it out of the way if I need to.

Yay! Now it's time to get other people to try your invention too!

Your turn!
What will you invent?

Inventor's Workshop

art by Mark Hicks

Ready to invent? Tools can help you turn your ideas into real, working inventions. Sometimes they might even give you an idea. But of course, the most important tool of all is your imagination!



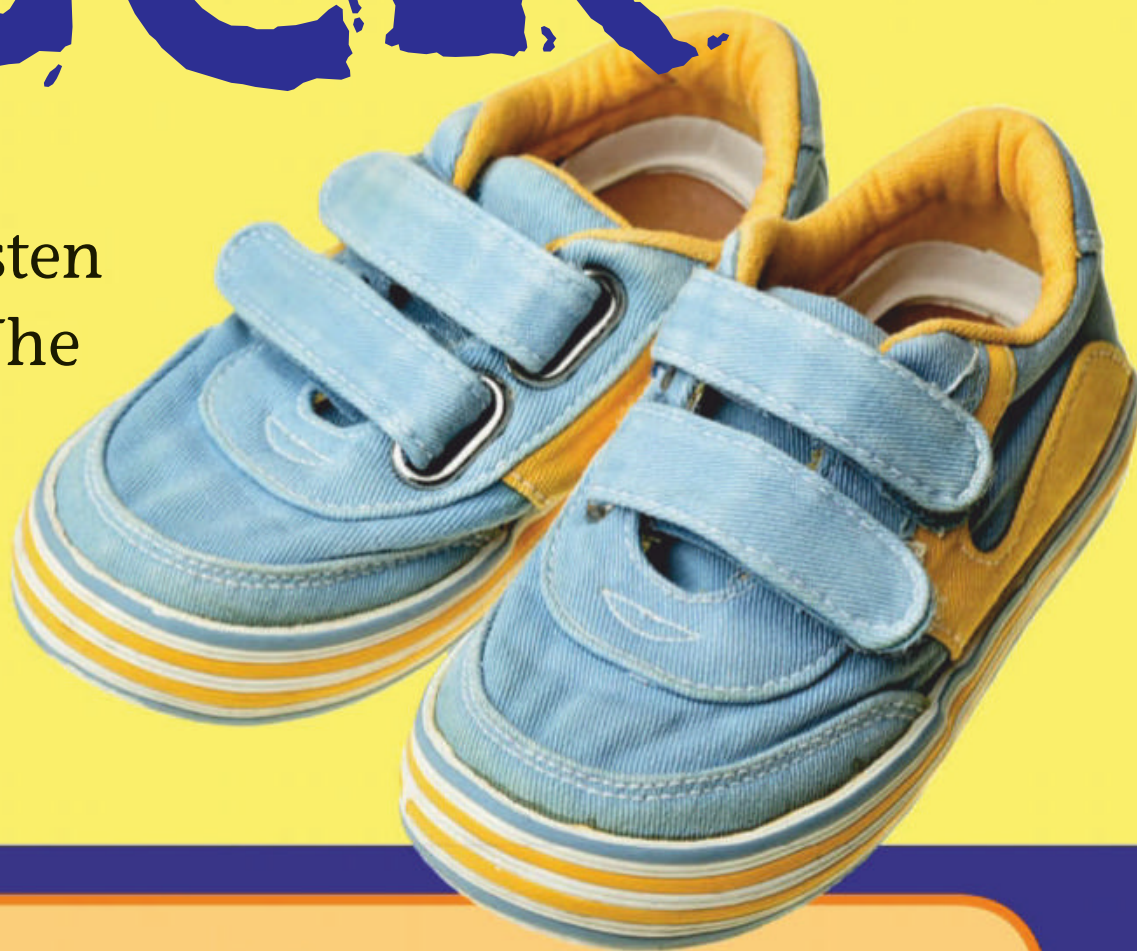
"To invent, you need
a good imagination
and a pile of junk."

-Thomas Edison,
famous inventor



STUCK

Lots of kids' shoes fasten with Velcro straps. The shoes and the strips are made in a factory. But what about the idea for Velcro? Where did *that* come from?



More than 70 years ago, George de Mestral was out hiking. But he kept having to stop to pull sticky burs from his socks and his dog's fur.

Poor
doggy.



Burs are covered with small, stiff hooks. They grab onto clothes, fur, or anything with a rough, fuzzy surface. They're annoying, but they gave de Mestral a great idea.



loops

He made two plastic strips. One was covered with stiff hooks, like a bur's spikes. He paired it with a strip with fuzzy loops. When the two are pressed together, the hooks hang onto the loops to keep the strips fastened.

hooks

Now Velcro is used to fasten clothes, diapers, and equipment on spaceships. And it all began with a walk in the woods.



A YUMMY INVENTION

by Tracy Vonder Brink

art by Sarah Gramelspacher


*Everything gets invented.
Even Popsicles!*



ops! Frank Epperson forgot
to bring his cup inside.

He'd made a fruity drink
by mixing a flavored
powder and water
together, but he
left it on the porch
overnight. The cup
had his drink and
the mixing stick
still in it.





The night was freezing cold. The next morning, Frank went outside and saw his cup. His drink had frozen. He pulled on the mixing stick. The frozen drink came out of the cup. It looked like a big, fruity icicle on a stick. Would it taste good? He licked the flavored ice. Yum!

Frank never forgot the icy treat he'd invented back in 1905, when he was 11 years old. When he grew up and had kids of his own, he made ice pops for them. Then he wondered . . . could he sell his dessert?





Frank took his ice pops to an amusement park. Everyone loved what he'd made! At first, he called his invention the Epsicle, because his last name was Epperson. But his kids didn't like the sound of that. They called their dad "Pop," so they came up with a different name, the Popsicle.

Popsicles were a hit! Frank made new flavors. People loved those too. Then a big company bought Frank's recipe. They made more and more Popsicles.

Today you can buy Popsicles on one stick, or on two. They come in many fruit flavors and even in chocolate.

Apple Strawberry Ice Pops

What you need:

2 cups apple juice
At least 6 strawberries
One plastic bag with a zippered or sealable top
One 12-cube ice cube tray
Plastic wrap
12 toothpicks

What to do:

1. Wash the strawberries and have a grownup cut off the green tops.

2. Put the strawberries in the plastic bag and close tightly. Make sure the bag is sealed.

3. Use your hands to squish the bag until the strawberries are almost completely mashed.



4. Pour the apple juice into the ice cube tray, but leave room for the strawberries.

5. Spoon mashed strawberries into each cube. If needed, add more juice to fill up the cubes. (You may not need all the juice.)



6. Cover the tray tightly with plastic wrap.

7. Poke one toothpick through the plastic wrap into each of the cubes.



8. Put the tray into the freezer.

9. Freeze until solid.

10. Remove the plastic wrap and twist the tray until the frozen cubes come loose.



11. Enjoy!

Create your own ice pop by trying different kinds of juices and fruits. Then name your invention after yourself! Did you make a Lilasicle? Or maybe a Jadsicle?

Animal Inventors

*You humans
think you're so smart
because you invent stuff.
Well, animals do too.*



Some **chimpanzees**

came up with a better way to catch termites to eat. They strip the leaves off a strong stick and push it into the hard walls of a termite mound to make a hole. Then they chew on the end of a different, softer stick until it shreds. It looks like the tip of a paint brush. The chimp pokes the brush into the hole it made to fish out the termites. Why make the second stick? Because more termites will grab and grip the soft brush than a plain stick.



New Caledonian

crows trim sticks so they can reach tasty bugs hiding in holes. Sometimes they twist twigs into hook shapes, which work better than straight sticks. They even connect short sticks into one long enough to poke into deep holes. Crafty crows also invented a way to move stuff too big for their beaks. Poke a stick into the object and carry it on the stick!



Hungry dolphins

in Australia poke the seafloor with their snouts to stir up yummy fish that hide among the sand and rocks. But sharp rocks can scratch a dolphin's sensitive snout. The dolphins' solution? A pad made from a sea sponge.

Sure, animals haven't invented anything like a submarine or a plane yet. But then we swim and fly just fine without them. We save our inventing for real problems.



Ada's Amazing Ideas

by Liz Huyck

art by Jeff Harter

Someday I'm going to win prizes for my inventions. But now I'm too busy to invent. Take today . . .

8:00 AM I have a great idea for a remote-control robot that picks up toys and puts them away. But Dad says Charlie and I need to clean up our blocks—now.



I look for the block box. Then I remember I flattened it to use as a sled after yesterday's snow. Oops!

I open the closet door to look for another box. That makes the empty shoe holder swing back and forth. The shoes are, um, being used for another project. But I get an idea. We can sort the blocks into the shoe holder. There's a pocket for every size.

10:00 AM I start to zip up my coat, and “Argh!” The zipper pull breaks off. There’s still a slidy bit with a hole, but it’s too small to grip. Someday I’ll invent an unbreakable zipper. For now, I look for a hook. Or some bendy wire, or—a paper clip! I grab one from Mom’s desk, bend the end out, poke it through the grip hole, then bend it back again. It works. It’s even pull-shaped. Zip!

Outside, everything’s slippery with ice. I grab the icy railing to keep from falling, and my fuzzy mitten sticks. How silly! Shoes slip, but mittens stick to ice. Wait, that gives me an idea.

I go inside and get an old scratchy pair of Dad’s socks. I pull them on over my shoes and step outside again. Yay! No more sliding.



Noon I'm eating lunch with my friend Fiona. Well, I'm eating—my fave, a peanut butter sandwich. She's chewing gum. Suddenly she yells, "Help, I have gum in my hair!" Ugh, it's a mess.

Fiona cries, "Will shampoo wash it out? Can we freeze it off with ice?"

I tell her I know what works best—peanut butter! (I don't tell her how I know this.) I scrape some off from my sandwich, goosh it into her hair, and sure enough, the gum gets soft and we can squeeze it out with a paper napkin. She does smell like peanut butter, but who minds that?



2:00 PM Robin and Jovan come over with a yummy jam roll. They say we can share, but how can we cut it? None of us are supposed to use sharp knives. I grab a spoon, but that will make messy scoops. Robin wants to keep the roll's jammy swirls.



I remember my uncle once cut cheese with a funny wire with handles. I don't have any wire, but I run to the bathroom to get some dental floss. It looks kind of wiry. And—yes!—it cuts pretty neat slices too.

4:00 PM Grandma's driving me to my swimming class. She's brought me a cup of cocoa. Yum! I slip off my shoes to relax my toes while I sip. Yikes! The cocoa is hot. I want to put it down to cool, but Grandma's car is old and doesn't have cup holders.



I spot my shoe on the floor. And, look, the hole where my foot goes in is kind of . . . cup-shaped!

Grandma likes my shoe-cup holder, but she says, “I think I’d better keep my shoes on while I’m driving.”

7:00 PM After dinner I have my favorite dessert, a grape ice pop. I want to eat it by the

wood stove, where it’s toasty warm. But that makes the ice pop drip. Someday I’m going to invent a dripless ice pop.

As I’m licking drips off my arm, Charlie comes in with a mini muffin. He doesn’t like ice pops. He peels off the paper cup. That gives me an idea. I snag it, poke the end of the ice pop stick through it and—

“Look, Mom,” I say. “No more drips.”



“Cool!” says Mom. Then she tells Mr. Fluffy, “Scat, cat!” She’s knitting socks for Dad, and the silly cat is chasing the yarn all over.

“When I’m an inventor, I’ll build you a cat-proof yarn holder,” I tell her.

“Great!” she says. “Will it be done soon?”

“Well, it’s a new idea,” I say. “I’ll have to think about

it.” As I think, I tap the funnel sitting on the table.

Dad was using it to fill the salt shaker.

Hmm, I pick up a ball of yarn and put it in the funnel, with the string coming out of the bottom.

It fits. There’s even a loop on the funnel

so it can hang on a hook, away from Mr. Fluffy.

“Maybe this will work until I finish my invention,” I tell Mom.

“Perfect,” she says. “And, Ada, inventions don’t have to be new devices. Using old stuff in clever, new ways *is* inventing.”

What do you know? I’m an inventor!



After the Wright Brothers



Only one person at a time could ride the Wright brothers' *Flyer*, and you had to lie on your tummy. Now planes like this Boeing 777 fit more than 300 passengers. The *Flyer's* entire flight traveled only 120 feet, nearly 100 feet shorter than the length of this jumbo jet.



Like the *Flyer*, the F-22 Raptor seats only one person, the pilot. But it's superfast. Built for the U.S. Air Force, it can fly nearly 1,500 miles per hour, faster than the speed of sound!

NASA's winged space shuttle *Discovery* didn't just fly in the sky. It flew in outer space—39 times, more than any other spacecraft.

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How do goldfish swim?

Discover the weird ways the world works in

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If you look at an X-ray of a goldfish, you might think it had swallowed a balloon. And in a way, it has!

Is there a
balloon in
my belly?

for ages 6-9

DOPPS! Starting to sink...
GULP! GULP! GULP!

I AM ALL LEVEL BABY...
the perfect balance.

TIME TO DIVE...
BURP!



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READERS of the Month



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age 6
Seattle, WA



Sarah S.
age 4
Mertztown, PA



Shaurya P.
age 5
Edison, NJ

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picture of
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Cardboard 9



Rubber bands 11



Wooden boards 12



Ruler 5



String and yarn 13



Nails 5



Markers 7



Paper clips 10



bedroom

kitchen

school

backyard



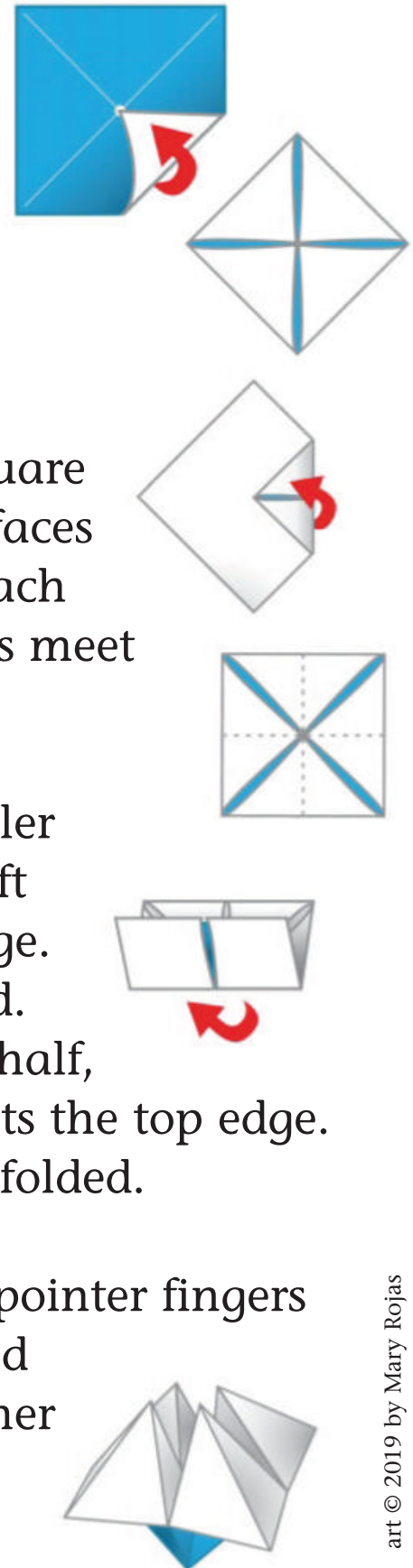
Tools of Invention

art by Mary Rojas

**Don't know what to invent?
Maybe this tool picker can help.**

How to make

1. Cut out the big square along the dotted line.
2. With the blue side of the square facing up, fold in each corner so the four points meet at the white center dot.
3. Flip the now smaller square over so its smooth side faces up, and again fold in each corner so the four points meet at the black center dot.
4. Fold the now even smaller square in half, so the left edge meets the right edge. Crease hard, and unfold. Now fold the square in half, so the bottom edge meets the top edge. Crease hard, and leave folded.
5. Slide your thumbs and pointer fingers under the four flaps, and push your fingers together and apart to open and close the tool picker.



art © 2019 by Mary Rojas



Scissors 8



Tape 4

Fabric 6



Hammer 6

How to play

With the tool picker closed, ask a friend to choose one of the tools on the flaps.

Open the tool picker one way, then the other, for each letter as you spell out the tool's name. For example, open it eight times for the SCISSORS. (The numbers on the flaps tell you how many letters are in each word.)

With the tool picker open, ask your friend to choose one of the tools shown.

Open the tool picker one way, then the other, for each letter as you spell out the tool's name. For example, open it four times for the TAPE.

With the tool picker open, ask your friend to choose another one of the tools shown.

Lift that flap to see a place. Can you and your friend think of a useful invention for that place? Can you use the tools you picked to make it?



